



HUMAN AND SOCIAL BIOLOGY

UNIT 1 - Living Organisms and the Environment Situations

Lesson

2

Cells

OBJECTIVES

At the end of this lesson you will be able to:

- a) Describe the structure of unspecialized plant and animal cells
- b) State the functions of cell organelles
- c) Identify specialized cells



(See Chapter 4 pages 15-22 in textbook)

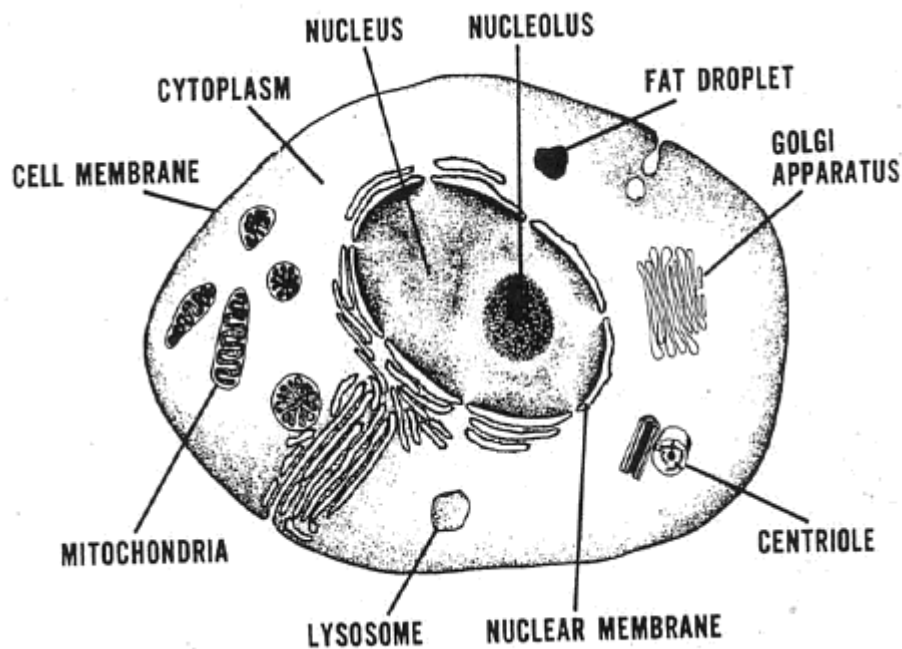
SECTION ONE – UNSPECIALISED PLANT AND ANIMAL CELLS

CELLS

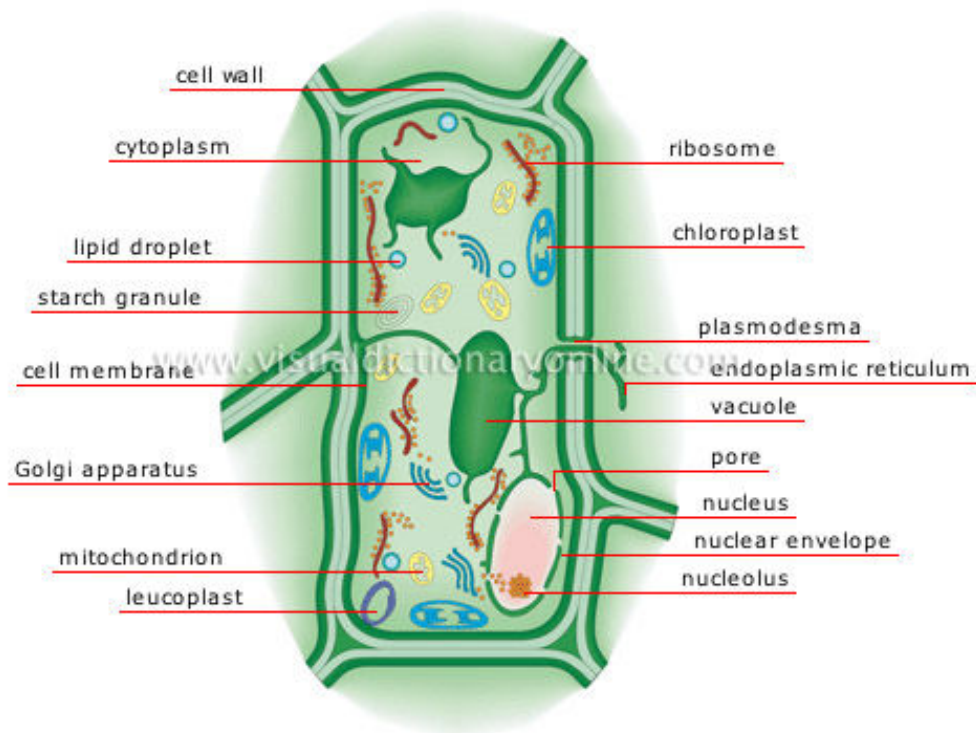
All living things are made up of cells which are the building blocks of the bodies of organisms.

Both plant and animal cells have certain common structures such as: a nucleus, cytoplasm, cell membrane, mitochondria and ribosomes.

Observe the structure of a typical cell shown on the following page; it is a diagram of a cell as if observed through a high-powered electron microscope.



Both plant and animal cells have these structures shown above. However a plant cell also has: a cell wall, chloroplasts and a very large vacuole. Look at the diagram below and note the different structures in a plant cell.





ASSESSMENT

Draw a table and compare the similar and different structures in a plant and animal cell by studying the diagrams above. Two have been done for you as an example.

STRUCTURE	PLANT CELL	ANIMAL CELL
Cell wall	X	✓
Nucleus	✓	✓

FUNCTION OF CELL ORGANELLES

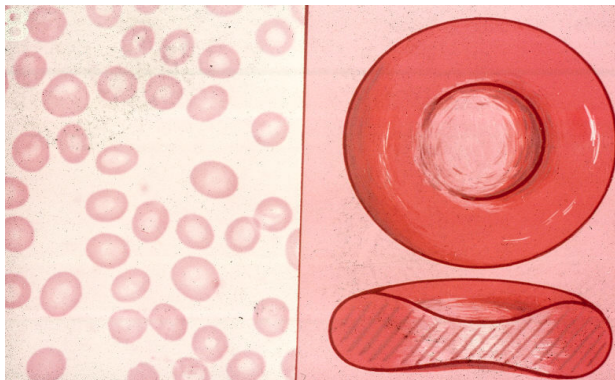
ORGANELLE	LOCATION	DESCRIPTION	FUNCTION
cell wall	plant, not animal	*outer layer *rigid, strong, stiff *made of cellulose	*support (grow tall) *protection *allows H ₂ O, O ₂ , CO ₂ to pass into and out of cell
cell membrane	both plant/animal	*plant - inside cell wall *animal - outer layer; cholesterol *selectively permeable	*support *protection *controls movement of materials in/out of cell *barrier between cell and its environment *maintains homeostasis
nucleus	both plant/animal	*large, oval	*controls cell activities
nuclear membrane	both plant/animal	*surrounds nucleus *selectively permeable	*Controls movement of materials in/out of nucleus
cytoplasm	both plant/animal	*clear, thick, jellylike material and organelles found inside cell membrane	*supports /protects cell organelles

endoplasmic reticulum (E.R.)	both plant/animal	*network of tubes or membranes	*carries materials through cell
ribosome	both plant/animal	*small bodies free or attached to E.R.	*produces proteins
mitochondrion	both plant/animal	*bean-shaped with inner membranes	*breaks down sugar molecules into energy
vacuole	plant - few/large animal - small	*fluid-filled sacs	*store food, water, waste (plants need to store large amounts of food)
lysosome	plant - uncommon animal - common	*small, round, with a membrane	*breaks down larger food molecules into smaller molecules *digests old cell parts
chloroplast	plant, not animal	*green, oval usually containing chlorophyll (green pigment)	*uses energy from sun to make food for the plant (photosynthesis)

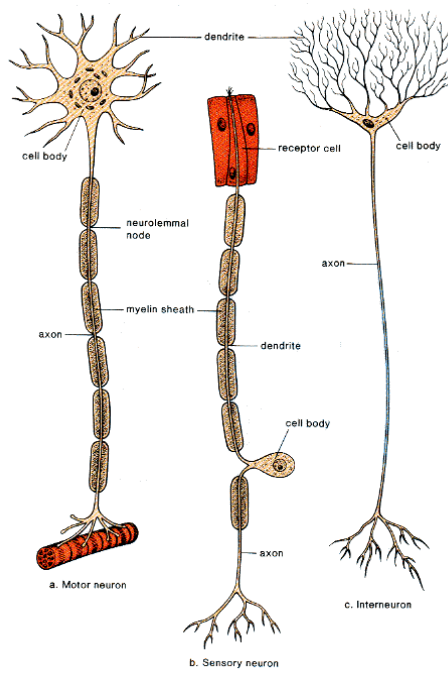
SECTION TWO – SPECIALISED CELLS

Cells become specialized to carry out one special function. These cells have a different shape and even organelles. Some examples include: eggs and sperms, nerve cells, muscle cells and red blood cells. Here are some specialized cells.

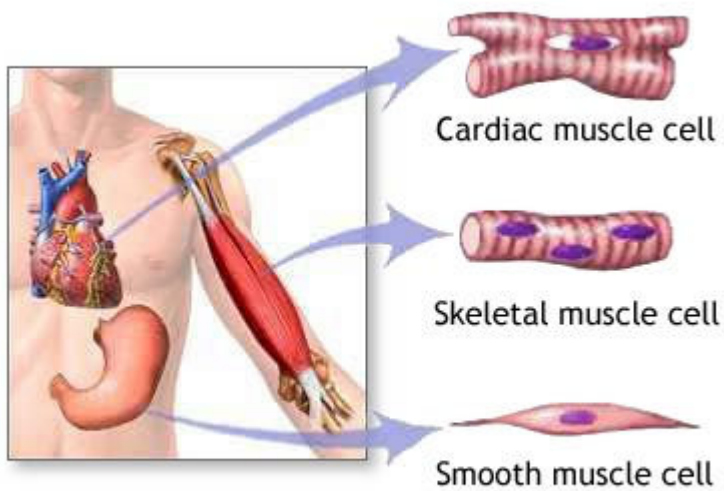
Red blood cells



Nerve cells



Muscle Cells

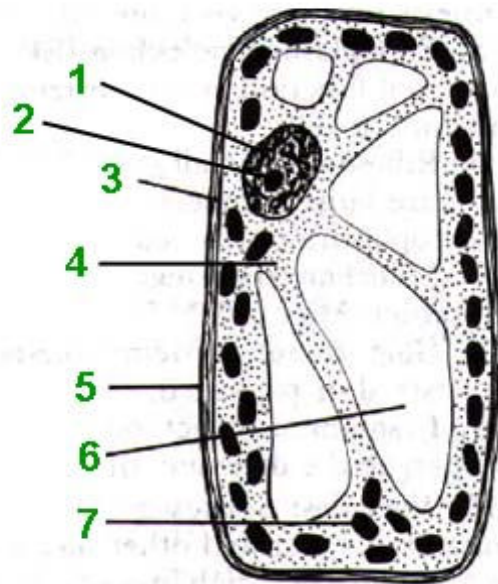


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ASSESSMENT

1. Label the typical plant cell shown below.



2. Fill in the missing information.

ORGANELLE	LOCATION	DESCRIPTION	FUNCTION
cell wall	plant, not animal	*outer layer *rigid, strong, stiff *made of cellulose	
cell membrane	both plant/animal		*support *protection *controls movement of materials in/out of cell *barrier between cell and its environment *maintains homeostasis
nucleus	both plant/animal	*large, oval	
nuclear	both		*Controls movement of

membrane	plant/animal		materials in/out of nucleus
cytoplasm	both plant/animal	*clear, thick, jellylike material and organelles found inside cell membrane	
endoplasmic reticulum (E.R.)	both plant/animal	*network of tubes or membranes	*carries materials through cell
ribosome	both plant/animal	*small bodies free or attached to E.R.	*produces proteins
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Do the end of chapter questions on pg. 25 of the text.